

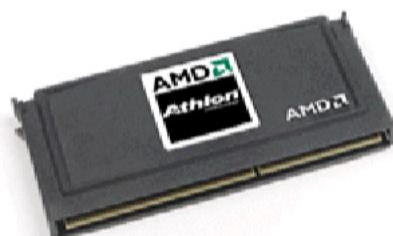
Gold Finger Device

MiscellaneousCooling

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Page 1 - Introduction, Maps



Nearly a year after the Athlon's debut, we have to admit that AMD has more than succeeded in entering the high-end processor market. Its very high level performance, especially in areas requiring intensive computing, has enabled it to quickly build up a very solid reputation, so much so that Intel (which was lining up the old Pentium III 250nm with its second level cache at half the processor speed) was forced to react in order to counter its competitor, which was up to 20% faster at the same frequency. It is thus the introduction on the market of the P3

Coppermine 180nm with its cache integrated in the processor which marked a big change in AMD's pricing policy. If previously the Athlon could afford to be more expensive than the P3 Katmai at the same frequency, this was because it was much faster... which is no longer the case with the P3 Coppermine. Today, an Athlon is up to half the price of the equivalent Intel processor for about the same performance (but there's no point in dwelling on this subject, which leads to polemics that make no sense), and it's available (while Intel keeps having supply problems with the Coppermine), and what we're interested in here, it's very largely overclockable.

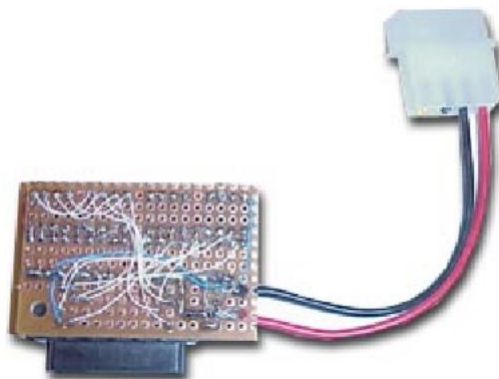
Thought for high frequencies, the K7 architecture should have a rather important margin for overclocking... and it is indeed the case, that's why, in order to avoid that mid and high range Athlons suffer from poor sales, AMD decided, contrary to what was happening for the K6-x family, to block the multiplier coefficient of the processor. But good news, AMD decided to use a different technique than Intel by defining this multiplier by a combination of resistors soldered to the processor board that can be changed. The voltage supplied to the processor is also defined in this way. However, AMD seemed to expect that the Coppermines would be, as usual with Intel, very overclockable, and in order not to lose the market of Power Users, AMD "left" a small connector on the processor board allowing to connect small peripherals used to modify multiplier and voltage coefficients. The prospects of overclocking were then beginning to appear on the horizon...

The overclocking cards

In the month following the launch of the Athlon, [Tom's Hardware Guide](#), which has a very good relationship with AMD, made public the various combinations of resistors defining voltage and multiplier. It was enough to solder to obtain a new voltage and a new frequency. At first, this was the only way to overclock an Athlon, and it was not without risk, as the resistors were really small. More than two months later, Tom proposed an overclocking board design using this famous connector present on the Athlons.

From that moment [Trinity Micro](#) launched the ball by proposing their GFD (Gold Finger Device), of which the first version did not

The Ninja Freespeed Pro did not even have a printed circuit board a thin cables soldered to the back of the card. Many cards with a more professional design started to appear such as the famous [Ninja Freespeed Pro](#) which remains for the moment the only card widely available in France. All these cards (except the [Afterburner](#) from Outside Loop Computers) were only pale copies of the design initiated by Tom Pabst... and today the situation has not changed much.



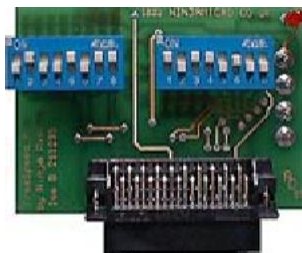
If today you are a little frustrated with your Athlon 500 to 700 which seems "weak", you will have to think about acquiring one of these cards in order to finally unleash the incredible overclocking potential of your CPU. But among the modest choice you have, you may wonder which card to choose? Spending 350FF on a Freespeed might make your heart ache a little and you wonder if this card is worth it?

As of today, only two cards seem to be officially available in France, the Freespeed Pro from Ninja Micro, a British card based on the German design of Tom's Hardware Guide and imported into France by [LDLC](#) and the K-Boost a 100% French equivalent. If other cards become widely available in France, I will not hesitate to add them to this comparison. For comparison purposes, I have also added the Bab card, well known by the forumers.

First of all, I would like to thank LDLC for the loan of the Freespeed, Netologic PC for the loan of the K-Boost, and Bab for the loan of the three successive versions of his card (a fact that I will develop a little later).

Page 2 - Ninja Freespeed Pro

Ninja Freespeed Pro



The Freespeed from [Ninja Micro](#) appeared in November in the US and was soon available in France thanks to [LDLC](#). The card has a size of about 6*4cm and is mounted in line with the Athlon. In addition to a red LED that allows you to check its power on, it has two sets of 8 DIP switches that allow you to set the multiplier and voltage of the processor it is mounted on. To connect to it, it uses the AMP connector that Tom presented in his article as the ideal solution to use... but it is not at all!

impossible to use the Freespeed in one of those cases where the power supply is mounted on the side perpendicular to the processor (on top). Like all cards based on Tom Pabst's design, it also requires a free 4-pin connector (like the one on your hard drives) in order to get power. Note that there is no duplicate connector as standard which can be problematic if you are already using all such sockets.

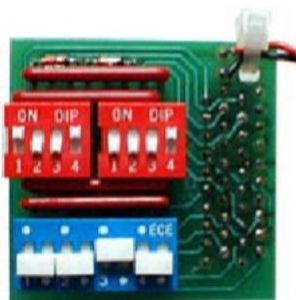
For any documentation, Ninja Micro offers a simple photocopy of average quality, both in terms of content and form. Indeed, the Freespeed is not the easiest to configure, the frequency setting being between the first and the second group of switches, and the numbers being then shifted compared to those indicated on the documentation. Moreover, voltages above 1.90v are not officially documented (you have to go to Ninja Micro's website).

As for the card, it has a very good quality of manufacture, and does not present any other defects.

In the end, this card is very reliable, but the choice of mounting it in parallel with the Athlon may be questionable because it is less practical or incompatible with certain configurations.

Page 3 - K-Boost

The K-Boost



The K-Boost is a card from the beautiful industry of our country. Designed and manufactured in France, it is functionally identical to the Freespeed Pro but has some conceptual improvements.

The first of these is the abandonment of the AMP connector in favor of another connector that looks like a simple cut-out PCI connector, but which is clearly not one. The card mounts perpendicular to your processor, which makes it compatible with all cases and cooling systems that I know of.

an 4*4cm and is therefore much smaller than the Freespeed. Its configuration is done at

the

by means of three series of 4 switches where each block corresponds to a specific setting. Much more pleasant and quicker to set up than the Freespeed while being much more compact, the K-Boost comes with a sheet of paper that serves as a manual. However this manual is quite complete, and it is bilingual French/English... the K-Boost has all the necessary assets to invade the European (world?) market maybe...

There is an important difference between the Freespeed and K-Boost manuals. While Ninja Micro suggests removing the plastic cover of the Athlon, the K-Boost manual prefers to advise cutting it off and explains it very well. For big overclockings, omit this choice, the temperature drop generated by the removal of the plastic cover being indeed more than noticeable (from 3° to 15°C in core temperature depending on the frequency and especially the voltage).

Voltages are documented from 1.45v to 1.95v, and frequencies from 300 to 1050 Mhz. The board offers a separate female plug for the power supply. If the soldering of the two cables is not a model of resistance, it is difficult to see how they could be torn off. Indeed, the collar clamping them on the board fulfills its role perfectly and the cables are literally pressed against the board.

This card is therefore a very serious alternative to the old Freespeed, which has hardly evolved since its release. The K-Boost is distributed by [Surcouf](#) and many other stores throughout France, mainly in Toulouse (e.g. Univers PC). All that can be reproached to this card is that it doesn't offer anything new compared to the Freespeed... unlike a card like the one from Bab...

Page 4 - Bab's card

Bab's card, the example to follow



This little card, designed as its name suggests (because it doesn't have a name yet) by [Bab](#) is radically different from all those currently on the market, both in Europe and worldwide. The main difference is that it does not use an external power supply and therefore does not require a resistor circuit to regulate the current like the Freespeed and K-Boost. The result is a cheaper and more reliable board, as there are no components that can fail on this type of board.

It also has a secondary CPU connector to connect to the Athlon, and mounts perpendicular to your CPU, like the K-Boost. It's even smaller than the K-Boost, and it's hard to believe that you can make a smaller model.

The first version of Bab's card was based on Tom Pabst's design like all the others. But instead of remaining passive without trying to improve its product as all the players in the market seem to do at the moment, Bab first added support for L2 ratio selection on its first card which still required an external power supply, and then radically changed direction by proposing a card with L2 ratio management and without external power supply.

To tell the truth, if this 100% French card (another one, cocorico) is not based on the German design of Tom's Hardware Guide, it is based on the equally German design of hardwarelab.de called tweakplug. Bab has added a little personal touch by offering the management of the L2 cache ratio. Only [Trinity Micro](#) offers a card based on this design, the Northwind GFD rev2. Unfortunately it doesn't seem to be produced in large quantities and it is no longer proposed with the kit allowing to change the L2 ratio.

The configuration of the card is very intuitive, since you only need to configure one row of DIPs, the second one being the complement of the first one. The manual, consisting of 3 pages illustrated in color, is of very good quality, both in its content and in its form. It illustrates well the most delicate operation: the installation of the small wires that allow you to choose the ratio of the second level cache of your CPU... an operation that remains simple moreover.

Although it is still quite handmade, this card exudes quality and should not pose any reliability problems. With features not found on any other card, a better manual and a lower price, it can be considered as the absolute overclocking card for Athlon. This card shows how it is possible to match or far exceed quasi-professional models with even a little knowledge of electronics.

If you would like more information about this card, you can contact [Bab](#) who will surely be happy to

answer you.

Page 5 - Test & Conclusion

The
test



Although in theory these cards all achieve the same speeds except for the L2 cache ratio setting - which has always been confirmed by the various comparisons on the Net - I still wanted to check some facts.

Indeed, when I exceeded 900 Mhz and 2.05v, I noticed that the Freespeed was giving off a lot of heat, the back of the card was simply burning, so I was wondering about the accessibility of higher speeds. That's why I did some tests in extreme conditions (Athlon 550 in 0.25 microns overclocked to 1000 on Abit KA7-100 lent by [Netexit Informatique](#)).

These very difficult conditions allowed me to realize that the Freespeed seemed to consume maybe a little more power than the other cards, which didn't really help my motherboard / power supply couple and which marked the end of the life of my old Asus K7M by burning its ATX connector. After some soldering and repairs, it works fine today, but it is still impossible for me to exceed 970Mhz with the Freespeed while it is no problem with the K-Boost or the Bab card.

Today these facts are confirmed by the KA7-100. Indeed, the monitoring allows me to see that my +5v is at 4.48v with the K-Boost and Bab's card in full load (a 0.25μ at 1Ghz consumes quite a lot of current), but at +4.36v only with the Freespeed which results in an almost instant reboot. Of course, these conditions are really extreme, and you shouldn't throw away your Freespeed for that. Especially since this problem is more due to a weakness of the power supply of my PC (a 300w Morex) than to a defect of the Freespeed, and there should be no problem with an Athlon engraved in 0.18 microns, which consumes much less current. But this is a problem that some overclocking freaks might eventually encounter, so I thought it was important to point it out.

Conclusion

What emerges from this comparison is a lack of ingenuity on the part of the manufacturers who have only followed the original design proposed by Tom Pabst more than 8 months ago. Since only the Freespeed and K-Boost cards are available in large quantities in France today, you can either go for the K-Boost, or try to build your own peripheral such as the Bab card. Last solution, you can also wait for some smart guys to get out of their new rich man's chair that allowed them to buy the first generation of Athlon overclocking cards and start thinking again...

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